

IN THE SPECIFICATION

Please replace the table beginning on page 2, line 1 with the following table:

Virtual Tributary	Format		Frame Rate (Mbps)
	Number of Rows	Number of Columns	
VT1.5	9	3	1.728
VT2	9	4	2.304
VT3	9	6	3.456
VT4 VT6	9	12	6.912

Please replace the paragraph beginning on page 4, line 16 with the following paragraph:

In particular embodiments, the communication protocol can be SONET. Each of the tributary payloads can be characterized by an arbitrary type or a same type. For example, in SONET, the types can include VT1.5, VT2, VT3 and ~~VT4~~ VT6. The limited portion of the buffer preferably depends on a corresponding location of the write pointer in the buffer, such that for each output column the corresponding location of the write pointer and the limited portion containing the set of input columns for reading are mutually exclusive.

Please replace the paragraph beginning on page 8, line 13 with the following paragraph:

There are four types of virtual tributaries defined for SONET, referred to as VT1.5, VT2, VT3, and ~~VT4~~ VT6, respectively. In particular, a VT1.5 tributary 310 has a size including 9 rows of 3 byte columns A1, A2, A3, resulting in a frame rate of 1.728 Mbps. A VT2 tributary 312 having a frame rate of 2.304 Mbps includes 9 rows of 4 byte columns X1, . . . , X4. A VT3 tributary 314 having a frame rate of 3.456 Mbps includes 9 rows of 6 byte columns M1, . . . , M6. A ~~VT4~~ VT6 tributary 316 having a frame rate of 6.912 Mbps and includes 9 rows of 12 byte columns, O1, . . . , O12.

Please replace the paragraph beginning on page 8, line 20 with the following paragraph:

SONET virtual tributaries are organized into groups, referred to as VT groups. Each VT group occupies 12 columns of one or more virtual tributaries having the same tributary type. The possible combinations that a VT group can carry include four (4) VT1.5 tributaries as in group 320, three (3) VT2 tributaries as in group 322, two (2) VT3 tributaries, as in group 324, and one (1) ~~VT4~~ VT6 tributary as in group 326.

Please replace the paragraph beginning on page 9, line 8 with the following paragraph:

A tributary time-space switch must not alter the temporal ordering of the columns within a tributary. For example, the

switch core cannot time-switch column 5 that is occupied by the first column of VT Group 320 with column 34 that is occupied by the fifth column of VT Group 320 in either the same or another STS-1 frame. Regardless of whether VT Group 320 carries only VT1.5s, VT2s, VT3s, or a ~~VT4~~ VT6, such time-switching reorders the columns temporally inside a particular tributary. In this example, column A2 would improperly precede column A1. The present invention takes advantage of this restriction to facilitate the memory reduction of the switch core.

Please replace the table beginning on page 12, line 14 with the following table:

Phase	R/W	Columns Read or Written	Remarks
1	Read	1 - 2N-1	First N columns of TOH.
	Write	30N - 31N-1	Write N columns.
2	Read	2N - 3N-1	Second N columns of TOH.
	Write	31N - 32N-1	Write N columns.
3	Read	3N - 4N-1	Third N columns.
	Write	32N - 33N-1	Write N columns.
4	Read	4N - 5N-1	N columns of POH (or an equivalent of one column of POH in an STS-Nc frame with N - 1 stuffed columns).
	Write	33N - 34N-1	Write N columns.

5	Read	5N - 33N-1	Can read the first columns of any VT1.5s and VT2s, up to the second column of any VT3s, and up to the third column of any VT4s <u>VT6s</u> .
	Write	34N - 55N-1	Write 21N columns
6	Read	5N - 48N-1	Can read the first column of any VT1.5s, the second column of any TV2s, up to the second column of any VT3s, and up to the fourth column of any VT4s <u>VT6s</u> .
	Write	55N - 62N-1	Write 7N columns.
7	Read	33N - 34N-1	Read N stuffed columns.
	Write	62N - 63N-1	Write N columns.
8	Read	26N - 62N-1	Can read the second column from any VT1.5s and VT2s, the third column of any VT3s, and the fourth and the fifth column of any VT4s <u>VT6s</u> .
	Write	63N - 77N-1	Write 14N columns.
9	Read	34N - 70N-1	Can read the second column from any VT1.5s, the third column of any VT2s, the fourth column of any VT3s, and the seventh and the eighth columns of any VT4s <u>VT6s</u> .
	Write	77N - 91N-1	Write 14N columns.
10	Read	62N - 63N-1	Read N stuffed columns.
	Write	1 - 2N-1	Write N columns from the next row.
11	Read	48N - 91N-1	Can read the third column from any VT1.5s, the third column from any VT2s, the fifth column from any TV3s, and the ninth column from any VT4s <u>VT6s</u> .
	Write	2N - 9N-1	Write 7N columns.

12	Read	63N - 91N-1	Can read the third column from any VT1.5s, the fourth column from any VT2s, the fifth and sixth columns from any VT3s, and the tenth to twelfth columns from any VT4s VT6s.
	Write	9N - 30N-1	Write 21N columns.

Please replace the table beginning on page 15, line 3 with the following table:

Phase	R/W	Columns Read or Written	Remarks
1	Read	1 - 2N-1	First N columns of TOH.
	Write	30N - 31N-1	Write N columns.
2	Read	2N - 3N-1	Second N columns of TOH.
	Write	31N - 32N-1	Write N columns.
3	Read	3N - 4N-1	Third N columns of TOH.
	Write	32N - 33N-1	Write N columns.
4	Read	4N - 5N-1	N columns of POH (or an equivalent of one column of POH in an STS-Nc frame with N - 1 stuffed columns).
	Write	33N - 34N-1	Write N columns.
5	Read	5N - 33N-1	Can read the first columns of any VT1.5s and VT2s, up to the second column of any VT3s, and up to the third column of any VT4s VT6s.
	Write	34N - 55N-1	Write 21N columns.

6	Read	5N - 48N-1	Can read the first column of any VT1.5s, the second column of any VT2s, up to the second column of any VT3s, and up to the fourth column of any VT4s <u>VT6s</u> .
	Write	55N - 62N-1	Write 7N columns.
7	Read	33N - 34N-1	Read N stuffed columns.
	Write	62N - 63N-1	Write N columns.
8	Read	26N - 62N-1	Can read the second column from any VT1.5s and VT2s, the third column of any VT3s, and the fourth and the fifth column of any VT4s <u>VT6s</u> .
	Write	5N - 19N-1	Write 14N columns. Columns 63N - 77N-1 are now aliased into these columns.
9	Read	34N - 62N-1 and 5N - 12N-1	Can read the second column from any VT1.5s, the third column of any VT2s, the fourth column of any VT3s, and the seventh and the eighth columns of any VT4s <u>VT6s</u> .
	Write	19N - 33N-1	Write 14N columns.
10	Read	62N - 63N-1	Read N stuffed columns.
	Write	1 - 2N-1	Write N columns from the next row.
11	Read	48N - 62N-1 and 5N - 33N-1	Can read the third column from any VT1.5s, the third column of any VT2s, the fifth column from any VT3s, and the ninth column from any VT4s <u>VT6s</u> .
	Write	2N - 5N-1	Write 3N columns.
12	Read	48N - 62N-1 and 5N - 33N-1	Can read the third column from any VT1.5s, the third column from any VT2s, the fifth column from any VT3s, and the ninth column from any VT4s <u>VT6s</u> .
	Write	34N - 38N-1	Write 4N columns.

13	Read	5N - 33N-1	Can read the third column from any VT1.5s, the fourth column from any VT2s, the fifth and sixth columns from any VT3s, and the tenth to twelfth columns from any VT4s <u>VT6s</u> .
	Write	38N - 59N-1	Write 21N columns.
14	Read	1 - 2N-1	First N columns of TOH.
	Write	59N - 60N-1	Write N columns.
15	Read	2N - 3N-1	Second N columns of TOH.
	Write	60N - 61N-1	Write N columns.
16	Read	3N - 4N-1	Third N columns of TOH.
	Write	61N - 62N-1	Write N columns.
17	Read	4N - 5N-1	N columns of POH (or an equivalent of one column of POH in an STS-Nc frame with N-1 stuffed columns).
	Write	62N - 63N-1	Write N columns.
18	Read	34N - 62N-1	Can read the first columns of any VT1.5s and VT2s, up to the second column of any VT3s, and up to the third column of any VT4s <u>VT6s</u> .
	Write	5N - 26N-1	Write 21N columns.
19	Read	5N - 19N-1 and 34N - 62N-1	Can read the first column of any VT1.5s, the second column of any VT2s, up to the second column of any VT3s, and up to the fourth column of any VT4s <u>VT6s</u> .
	Write	26N - 33N-1	Write 7N columns.
20	Read	62N - 63N-1	Read N stuffed columns.
	Write	33N - 34N-1	Write N columns.

21	Read	5N - 33N-1 and 55N - 62N-1	Can read the second column from any VT1.5s and VT2s, the third column of any VT3s, and the fourth and the fifth column of any VT4s <u>VT6s</u> .
	Write	34N - 48N-1	Write 14N columns.
22	Read	5N - 33N-1 and 34N - 41N-1	Can read the second column from any VT1.5s, the third column of any VT2s, the fourth column of any VT3s, and the seventh and the eighth columns of any VT4s <u>VT6s</u> .
	Write	48N - 62N-1	Write 14N columns.
23	Read	33N - 34N-1	Read N stuffed columns.
	Write	1 - 2N-1	Write N columns from the next row.
24	Read	19N - 33N-1 and 34N - 62N-1	Can read the third column from any VT1.5s, the third column from any VT2s, the fifth column from any VT3s, and the ninth column from any VT4s <u>VT6s</u> .
	Write	2N - 9N-1	Write 7N columns.
25	Read	34N - 62N-1	Can read the third column from any VT1.5s, the fourth column from any VT2s, the fifth and sixth columns from any VT3s, and the tenth to twelfth columns from any VT4s <u>VT6s</u> .
	Write	9N - 30N-1	Write 21N columns.